

THE EFFECTS OF MODERATE PRENATAL ALCOHOL EXPOSURE ON THE ORGANIZATION OF EXPLORATORY BEHAVIOR BY ADULT FEMALE RATS.

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Research has indicated that prenatal alcohol exposure (PAE) can produce impairments in cognitive processes such as spatial learning and memory. The neurobiological basis of these impairments is poorly understood but has been linked to structural alterations in the hippocampus and deficits in hippocampal synaptic plasticity. Damage to the hippocampus can also produce locomotor hyperactivity and disrupt the expression of exploratory behaviors. Rodent exploratory behavior is organized around home bases, which serve as a reference point from which animals organize their exploratory excursions into the remaining environment. We therefore sought to test the hypothesis that exploratory behaviors would be disrupted after PAE. In the present study, we utilized a rat model of moderate PAE (60 mg/dl peak blood alcohol content). Adult female PAE and saccharin (SAC) control rats were allowed to freely explore a circular platform (5 ft dia) for ~30 min. Animals were tested in two conditions: (1) a dark test in which the room lights were turned off and the experiment was conducted under infrared light, and (2) a condition in which the room lights were turned on. Thus, under dark conditions, animals were required to use self-motion cues to guide exploratory behavior, while in lighted conditions the animals had access to visual stimuli. Our preliminary analyses indicate that PAE rats were able to establish home bases within the first 5 minutes of exploration under both light and dark conditions. Home base behavior was typically maintained throughout each test session. Furthermore, exploratory behaviors, such as excursions to and from the home base, stops within the home base, total distance traveled, and grooming were also observed to be similar to that of SAC controls. These results suggest that rats exposed to moderate levels of alcohol prenatally are able to organize their exploratory behavior around home base locations. While this pattern of behaviors may indicate that moderate PAE does not impair the gathering of spatial information from a novel environment, future studies are needed to determine whether spatial information is retained after exploratory behavior.